

THE
MANAGEMENT
—OF—
Pulmonary Phthisis,

—BY—
KARL VON RUCK, B. S., M. D.,

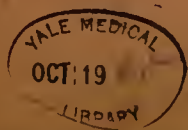
Member of the American Climatological Association, Member of the
American Medical Association, etc., Director of the Winyah
Sanitarium, for Diseases of the Throat and Lungs,

ASHEVILLE, N. C.



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Although much has been written upon the subject of chronic phthisis and its treatment, there exists by no means a uniformity of opinion among the profession as to the best method to be pursued for the prevention and cure of this disease. Even since the discovery of the bacillus of tuberculosis and the recognition of its etiological relation to all forms of consumption, while placing the diagnosis out of the domain of doubt, no material advance has been made in treatment. All our efforts directed against the bacillus have proved a complete failure, and in the endeavor to find a specific to make harmless or destroy the germ, the expectative-symptomatic general therapeutics have been neglected or lost sight of. Clinical experience even in the light of the tubercle bacillus as the active agent in the destructive processes must recognize additional etiological or predisposing factors which furnish the conditions necessary for the growth and development of this germ, and these are not so apparent as to exclude room for doubt and variance of opinion. Until this problem is finally and satisfactorily disposed of, the profession must of necessity be divided in their estimation of the value of treatment, unless accident furnish us with an unfailing remedy, amounting to a specific. In the meanwhile there will be those who believe in the germ, as the only factor, to such an extent, as to make its destruction and elimination from the diseased organism the chief object of treatment; and again, those in whose judgment and in the light of whose observation, a certain predisposition

of the organism is required for the growth and development of the germ, and who seek by treatment to overcome this predisposition as a prophylactic measure, and to eradicate the effects of the germ in the established disease with a view to cure. Another class are seemingly entirely at sea, having no fixed idea of either etiology or treatment. They consider the bacillus as a probable product of the disease and have refuge to the terms of "predisposition and inheritance" without accounting for either, in the meanwhile giving drugs and cough-mixtures, or taking up anything that may be proposed, to finally advising a change of climate, when the case has become hopeless. Inasmuch as the practitioner who is confronted with the disease cannot wait for the discovery of the specific, it behooves him to pursue such a course of treatment as experience has shown to give the most favorable results.

The treatment by climate and nutrition enjoys the greatest favor, not only by the large majority of practical physicians, but by the laity as well. But as to the condition of climate required and the best method by which nutrition is to be accomplished opinions differ as widely as possible.

In my opinion climate in the treatment of consumption is only one of the means, but a most important one, favorable to nutrition, if by nutrition we not only expect to furnish the consumptive with enough to eat, or give him a selected diet of great food value and one easy of digestion, but if we take the term in its wider sense and for its accomplishment make use of every means, which on the one hand, directly or indirectly aids in restoring or maintaining healthy functions of all, but especially

of the respiratory organs, and on the other wards off every injurious influence which directly or indirectly may interfere with the accomplishment of our object.

The benefits derived from nutrition in this sense furnish also a certain light in the recognition of additional etiological or predisposing factors of the disease apart from the tubercle bacillus, and by reasoning thus backward, we arrive at conclusions advocated by Dr. Hermann Brehmer over thirty years ago. He then saw in Rokitansky's description of the phthisical habitus, or the so-called paralytic thorax, the characteristics of which are voluminous lungs and a disproportionately small heart, what he called the chief etiological factor of phthisis; and by tracing its acquirement to insufficient nutrition, especially during the period of growth and development, and which of course can also be inherited from consumptive parents, or those who although possessing the phthisical habitus in perhaps a lesser degree have themselves to the time of childbirth escaped, or from those whose constitution had been impaired from other causes, the disposition or liability to the disease was more satisfactorily accounted for, than by any other theory before or since. But let this theory which has since received confirmation by experiment and observation upon the lower animals, by Nathusius, Baudement, Beneke and others, be correct or at fault, Dr. Brehmer's method of management based upon it and the indication to overcome the disproportion between the lungs and heart, has given better practical results by far than any other, and finds acknowledgment by all who have applied the principles involved.

The object of this paper is to point out the best method

to utilize nutrition in its widest sense, for the prevention and cure of phthisis. In a disease so serious, so prevalent and so difficult to cure, the *best* will never be found too good, and while I do not contend that patients have not recovered under less favorable or even adverse circumstances, and under all sorts of climatic conditions, I simply advocate that the most favorable circumstances must of necessity offer a better prospect for the individual case, and lead to improvement and recovery in a proportionally larger percentage.

Before entering into the details of the management, which I propose, I desire for comparison to review our methods as usually applied, to indicate or make apparent their defects, and to show that the benefits derived are more rationally attributable to their influence upon nutrition, than to some inherent unknown specific property over the disease in question.

OF MEDICAL AGENTS. *The preparations of Phosphorus*, especially the hypophosphites, so largely prescribed some years ago, and still held in professional favor, have been supposed to exert some special influence upon the tubercular process in general, and according to their basic associations to favor softening and expectoration, produce calcareous changes as a means of cure, diminish expectoration, acting upon hæmatisation, and toning up the health in general.

With the practical physician these distinctive effects were unattainable or lost sight of, leading to combinations of one or more of the salts, or of all of them, as in the well known Fellow's preparation and its many substitutes, which are supposed to do good all around. Patients have undoubtedly improved under their use, and

some may have recovered, but I have never been able to satisfy myself, that by the use of one or the other of these salts any special indication could be complied with, and found their benefit in exact proportion as they seemed to influence nutrition by the tonic effect of Phosphorus upon the nervous system, or the influence of the bitter and iron preparations upon the digestive and blood making processes.

In the majority of my cases no apparent effect resulted from their employment, in a certain number the digestive organs seemed to become deranged, especially after prolonged use, and my results were not markedly different, then under the exhibition of phosphorous in other forms, or the salts of iron and the various vegetable bitters.

Arsenic, Calomel, Creosote and Iodoform taken internally and under certain conditions of digestive derangements, have been and are still employed, not only in Phthisis, but when such derangements are due to other causes.

Why their influence in Phthisis should be more specific no one has been able to demonstrate. That they have no influence upon the bacilli is well known, and they could not be expected to have under the doses permissible.

With a strumous or syphilitic cachexia, we can readily see additional reason for benefit from iodoform and mercurials, and the employment of any one of these agents for certain indications; as for instance, to aid digestion and assimilation is quite another matter, than their continued exhibition for the cure of the disease, which cannot but lead to injury. *Cod Liver Oil* and other fats

and their emulsions have a certain food value, and when readily taken and assimilated are useful aids to nutrition.

Raw Beef Diet—Salisbury's method :

In cases where intestinal digestion and the assimilation of hydrocarbons is much interfered with, either by affections of the glandular apparatus, or catarrhal state of the intestinal mucous membrane, with or without tubercular disease, the raw beef diet as proposed by Salisbury, is an important aid to nutrition, until such affections have been relieved or cured and a mixed diet can again be resorted to.

That there is anything specific in raw meat by which we can hope to influence the tubercular disease is no more likely to be true, than as has been held by others, that a diet entirely free from nitrogenous matter should prove especially beneficial in that direction. The regulation of the kinds of food must always depend upon the state of the digestive organs, the greater the possible range of variation in diet the better will be the general progress of nutrition.

Rectal Enematas of Sulphureted Hydrogen have had their day, and require no comment.

Inhalation of the Vapors from Hydrofluoric Acid never found many advocates in America, and the latest reports from Europe seem entirely adverse to the claims made for this method of treatment.

Inhalation of Oxygen.

Undoubtedly some benefit has been derived from such inhalations in anæmia and digestive derangements, also in certain forms of dispnoea. I have seen patients made much more comfortable after each inhalation, especially

when a small quantity of nitrous oxide was added. I have also seen an occasional but undoubted increase in the number of red blood corpuscles under its administration, both in essential and symptomatic anæmia, especially when iron preparations which alone had proved inefficacious, could be administered at the same time. Its range of usefulness in consumption is secondary altogether to many other means, and it is only occasionally that anything more than temporary relief can thereby be given, and no matter how plausible the theory as to its influence upon nutrition, practical experience shows that its use is always experimental, and frequently without result, the same as is the case in its employment in other diseases. Its mixture with nitrous oxide, in the form of the so-called "compound oxygen" by the temporary stimulating or intoxicating effect of the laughing gas, has no advantage whatever, except in dispnœa, but it makes the patients who become the victims of charlatants, feel that "something powerful" is present in such inhalations, and induces them to believe in it the more readily. This "compound oxygen cure for consumption" still flourishes in many localities, the same as do the quack remedies for the same object upon the shelves and counters of our druggists, and I have no doubt the vendors of such, with their advertisements, are as injurious parasites upon the consumptives as are the tubercle bacilli themselves, and while we must acknowledge that our efforts in phthisio-therapy against the latter, have thus far been unavailing, many lives could undoubtedly be saved if the former could be extinguished by the enactment of wise laws which would oblige them to derive their means of livelihood otherwise than by trifling with human life.

In several cases of dispnœa, in connection with extensive softening, where I administered oxygen chiefly for temporary relief, and in which 40 to 60 gallons were used during the day, I observed a well marked coinciding fall of the temperature. The gas in these cases was passed through a solution of the volatile Pine Needle Oil, hoping that a certain portion of it would be converted into ozone, and by so doing a disinfecting and antiseptic effect upon the abundant and somewhat offensive secretions would result, and while the apparent fall of temperature may have been accidental and due to other causes, its repeated occurrence under the same circumstances would justify further trial of the remedy with this view; in neither case was there any effect upon the dispnœa until nitrous oxide was combined, and then the relief only lasted for a few minutes.

Inhalation of the fumes of burnt sulphur, the patient remaining in the sulphurous atmosphere for hours at a time, have not produced any effect upon the disease, or any of its symptoms, in my hands; in some cases the cough was much increased.

Inhalations of atomized or vaporized substances, while not affecting the local processes of the disease in the lungs, are useful in the catarrhal affections of the upper air passages, and aid expectoration of viscid sputum. I use vaseline with or without Pine Needle Oil, Terebene, Sulpho Carbolate of Soda, Chloride of Soda or Ammonia, the balsams, menthol, etc., etc., either as I wish to stimulate or soothe the mucous surfaces, or favor expectoration.

The Respiratory Differential Process, after Ketcham-Williams, has been an important aid in my hands, as a

preventive, and also in the course of the disease when active processes had been arrested.

Much harm may, however, result from this method, by an indiscriminate and routine use of the same. After a personal experience of nearly four years, in several hundred cases, I have materially changed my views held at an earlier period, as to the range of applicability and the indications for this method.

The benefits to be derived are a better expansion, ventilation, and improved circulation in the lungs, besides the calisthenic effect upon the respiratory muscles; which must again be looked upon as aids to local and general nutrition.

The latest and now perhaps most popular method for the cure of Pnthisis is the *Inhalation of Hot Air* after Weigert, and the machines for the purpose, despite their high price, have at present an immense sale. I too, possess several, and have treated 13 cases for periods extending from a few weeks, to several months, mostly at the urgent request of patients, who were captivated by the sensational articles in the public press. From carefully conducted experiments, I find that the degree of heat claimed by the inventor is never reached, except in the heating chamber, and not with the air of inspiration or expiration. The former with the thermometer of the machine at 300° C. *and the valves in place*, measured in the mouth piece only 150 to 175° F., according to the rapidity and fullness of the inspirations, whereas the expired air never exceeded the body temperature.

With the cup-valve, which prevents the return of the expired air into the heating chamber, removed, the effect was greater, the thermometer of the machine register-

ing 210° C., the air in the mouth-piece reached 280° F. The mouth-piece itself became so hot that it could not be held between the lips, and the burning in the mouth, throat and trachea, so unbearable, that the inhalation had to be frequently interrupted. Under this increased heat profuse perspiration generally occurred after a few inhalations. Even then the air of expiration only reached $101\frac{1}{2}^{\circ}$ F. The same temperature was registered in the mouth, while the body temperature was not influenced.

While I expected somewhat higher values for the expired air, nevertheless I was not surprised after considering the diffusion of the hot air with the air remaining in the lungs, the minute spaces of the bronchioles and alveoli, in which the air is quickly equalized in temperature to that of the blood, and the large quantity of blood passing through the lungs, constantly abstracting, and again losing the heat in passing through the system.

It would therefore appear improbable that the lung tissue could ever exceed in temperature that of the blood itself. Although the air in the lungs may show several degrees in excess, it would scarcely affect the bacilli, and especially not in consolidated area, where exudates into the alveoli, or obstruction of the bronchioles leading to them, would practically prevent any heating of these parts unless through the blood.

This proposed cremation of the germs within the body is therefore utterly impossible, and the glory to be reaped by the discoverer of the specific agent for the destruction of the tubercle bacilli within the living organism awaits another man than Weigert!

Nevertheless it has appeared in my limited number of cases who pursued this method of treatment, as though

some benefit was derived from it in two instances, where a marked diminution of the previously abundant moist rales, and a falling off in the amount of expectoration undoubtedly occurred.

I attribute this to the relative dryness of the inspired air, which I shall show further on has a favorable influence upon such conditions.

In two cases the inhalation had to be abandoned in the course of the first week, on account of the irritation and cough therewith produced. In one case the cough was so severe as to produce slight hemoptysis.

In three other cases the remedy had to be discontinued, first temporarily and finally altogether, on account of irritative effects upon tubercular ulcerations of the larynx, which were in the process of healing from other treatment, and which under the hot air assumed an extending character with œdematous edges. Complete aphonia resulted in one case, with recovery of the voice after a short intermission, the aphonia to appear again upon resumption of the treatment. It was, however, reasonable to expect favorable results in laryngeal Phthisis, as the lesions there are particularly exposed to the influence of the heated air.

The remainder of the cases showed no influence, one way or the other, due to this treatment. The two improved cases continue with the method yet, so far without further benefit. Most careful examination of the sputum made in the beginning, and during the course of this treatment, never showed any material diminution in number or change in form of the bacilli, but their presence varied as before at different times, or on different slides prepared at the same time and from the same specimen.

In the light of this experience, the hot air inhalations can never be expected to comply with any indication in the treatment of phthisis, for if we desired the benefits of dry air, we would take advantage of dry climates, or of chemically dried air, rather than of such a disagreeable, and to some extent, even injurious method of administration, as we have in the Weigert method.

Deep injections into the lung tissue of Phenol or Iodine solutions are not used as much as they were some years ago; I have myself found the results obtained to be very uncertain and not justifying the continuance of such practice.

Incision and drainage of accessible cavities, can only be of benefit under very exceptional circumstances, as occurred in one of my cases in private practice, and in which the result was very satisfactory. The case was one of then so-called fibroid Phthisis, which had progressed to complete cicatrization in both upper lobes, leaving as the only troublesome sequela a cavity in the left lower lobe, just below and inside to the lower angle of the scapula, with an insufficient outlet, causing the secretions to become stagnant and retained, to be expectorated with great difficulty every week or ten days. The filling, for a few days before this periodical expectoration, was attended by fever and circumscribed pain, frequently necessitating the use of morphia, five or six days of perfect health intervening between the attacks. This condition had continued for three or four months, when I incised the cavity, resecting one rib, and inserted a large drainage tube. The cavity held ten ounces and was in communication with a bronchial tube from which the air of inspiration escaped with every respiratory

act. There was much pleuritic thickening, the walls of the cavity were irregular and a number of small fragments of lung tissue came away. Harsh respiratory sounds were audible in the adjoining lung portions. The bronchial communication became permanently closed after the 11th day, but the filling up and cicatrization were most tedious and were not completed until nearly a year from the time of the operation. There was no cough or expectoration after the first day, and the general health improved very rapidly and was good when last heard from, four years after. I had previously injected this cavity with iodoform repeatedly, and without the least benefit.

We come now to *climatic* treatment of phthisis. With many practitioners this means simply a change of climate from cold to warmer, or very warm to cooler localities. On this principle Northern patients are sent South in the Winter, and Southern consumptives to Northern points or cooler mountain regions.

It is well known that the native inhabitants of some places, and especially of elevated regions, enjoy a certain relative immunity from consumption, but no one can definitely say by what particular factor the favorable and beneficial influence of such climate can be explained. It is probably not one factor but the aggregate of many. Elevation seems common to all such places, and would perhaps best explain the favorable influence upon nutrition that we frequently see.

With a reduction in atmospheric pressure the labor of the already small or weakened heart is certainly less, consequently the circulation is better, and thereby nutrition is benefited. That a weak and small heart,

under otherwise favorable influences, may attain a certain amount of compensatory hypertrophy, at elevated regions, is very probable; clinically I am well satisfied that its action, although at first more rapid, becomes stronger and slower.

Whatever the factor or factors may be, it is rational to assume that a locality in which native inhabitants show a marked immunity from a certain disease, will also be beneficial to those predisposed to, and aid in restoring those already affected by it. Experience has demonstrated this beyond controversy.

The first requisite then in selecting climate for a consumptive or one predisposed to the disease, is that the place contemplated shall have established its relative immunity from this disease.

If this is the case with a number of places, the choice will be further determined by the conditions for care and comfort which the patient may find, the clear and fair days allowing of much "out of door life," and, perhaps, the distance the patient may have to travel.

I do not wish to be understood that consumptives are not benefited at points where no relative immunity from the disease exists, but I claim that it would be more rational to send our patients to such points, inasmuch as experience has shown them to be the most favorable to prophylaxis, as well as cure.

The conditions for care and accommodation at some places where an immunity from the disease does exist, are sometimes such as to preclude even their consideration, and these advantages easily obtainable at points without immunity may turn the scale of our judgment in their favor.

With patients far advanced, and where prolongation of life is the only consideration, conditions of temperature, pleasant weather, ease and comfort are the essentials to be looked for, and when these are within reach at home such patients should never be sent away, but if sent away the nearest favorable locality should be chosen.

The advantages of climate, however, are not often, if ever, derived to the greatest degree obtainable, by even favorable cases in the early stages of the disease. This is largely due, not only to want in care and proper accommodation at climatic resorts, but also in no small measure to the errors of commission and omission on the part of the patient. No physician who sends his patient away can so instruct him, and provide for self-management during his absence, as to secure the best results. Besides, it is one thing to advise a patient, and quite another to treat or manage the case.

One case, which particularly impressed me, may serve as an example, by showing how, under favorable climate and in an early stage, a case may become hopeless by self-management and distant professional advice. I refer to a gentleman who, at his physician's recommendation, came to Asheville last fall, and soon after his arrival consulted me in regard to admission into my institution.

The prospects for his recovery seemed to me very favorable, with only one upper lobe involved; there was no breaking down, he was free from fever and night-sweats and cough, had a good appetite and good digestion; his weight was 153 pounds.

He consulted with his home physician, who, while not absolutely disapproving, suggested to his patient that he

was *not sick enough* to require the advantages of management in a sanitarium, and repeated his parting advice, to continue with cod liver oil and take plenty of out-of-door exercise, riding, walking, climbing the mountains, &c., being all that was really necessary.

All went well for about a month, during which time he had gained several pounds of flesh, and his appetite had become almost ravenous.

Owing to over-eating, or, as he would have it, to the poor cooking of his food, an acute attack of indigestion with diarrhœa resulted, and when matters went smooth again he had not only lost all the flesh he had gained, but seven pounds in addition. He resumed his accustomed exercise, often to extreme fatigue, until he came to a stand still by the occurrence of headache, accompanied by chills and fever every afternoon; this he attributed to malaria, and took quinine in large doses, crowding all his exercise into the hours of the forenoon, as he was unable to go out later. Finally, a local physician was called in, to treat him for pleurisy, and prescribed for him for a short time. After some weeks, and with the occurrence of copious expectoration, his fever subsided considerably, and now reduced to 120 pounds, his general health again improved, he resumed his out-of-door exercise, returning from his rambles tired, exhausted, and several times with a thorough wetting, being overtaken by rain.

Night-sweats, which were but slight during his relapse, became now more profuse, requiring a change of clothing several times during the night. Unfortunately he was in a room without heat during sleeping hours, and he frequently became so chilled that he could not get warm until morning.

An acute inflammatory attack of the right lung followed, attributed by him to exposure in an out of door privy, which kept him in bed two weeks. His diet during that time, as on previous occasions, was the same as that served at the table of his boarding house. Three regular meals of solid food were served him in his room, and he could eat but little. When able to be out again his weight was reduced to 107 pounds. He was so weak that horse back and walking exercise as well as mountain climbing had to be given up for short carriage drives, and with so much benefit, that during the following two or three weeks he gained in flesh and strength sufficiently to again take up his walks to the mountains, but upon returning from his last trip he was overtaken by a moderate hæmorrhage. This laid him up for nearly a week and now he believed himself sick enough to enter a sanitarium, and again consulted me, and also wrote to his physician for his advice. A few days before his departure, he called and informed me, that as we were full and he could not be admitted immediately, his physician advised him to go to Thomasville as the Asheville climate did not seem to agree with him !

I am sure that this was not an exceptional case, only differing from many others in the fact that he gave this particular climate a longer trial. Many such patients themselves arrive at such conclusions earlier, and move from place to place, repeating the same follies and indiscretions, and ascribe their relapses to everything else, except the right cause. On the other hand there are a goodly number who get along better, and derive more benefit in proportion to the judgment exercised, and the comforts enjoyed. Now, I have no doubt

that this patient's understanding of "out-of-door exercise," was entirely different from what was meant by his physician in his general directions, and that he would in all probability have been better off at home; but with climate in his favor, and under proper care he should have recovered.

What measures then shall we employ to overcome the pre-disposition to phthisis, and how shall we best treat it when developed?

As a prophylactic measure we must attend to nutrition in its widest sense during the growth and development of children, especially of such as by their family history, or the presence of acquired evidence, seem pre-disposed to the disease.

Such children should live an out-of-door life, in a favorable climate, should be restricted to short hours of school work, sitting in a stooping position should be avoided, the appetite and digestive functions stimulated by judicious muscular exercise, the food should be simple and nutritious, a proper amount of sleep secured, and the development of the upper thorax be favored by gymnastic exercise and respiratory practice.

Indurated or inflamed scrofulous (tubercular) glands should be extirpated wherever accessible.

A climate that possesses immunity from this disease should, if possible, become the permanent residence of those in whom the tendency is strongly developed, and the final occupation should be one that assures much out of door life. Unfortunately this is not always attainable except in those cases where abundant means are possessed, and even those are frequently not able to see the importance of prevention.

An early diagnosis, the importance of which can never be overestimated in any serious malady, is the more important in phthisis, as the initial symptoms are frequently obscure, and the early stages only give reasonable ground for hope of the most favorable results from treatment.

How commonly the family physician lulls the fears of patients and their friends by the assurance that only the bronchial tubes are affected, or that "throat-trouble" is all that is the matter, or by referring the cough and expectoration to the liver, the chills and fever, or general failure of health to malaria, is well known; and yet, with all these excuses, such patients are nevertheless often put upon hypophosphites, creosote, cod liver oil, or some other treatment against phthisis, showing that the medical adviser did not make the diagnosis, which was uppermost in his mind.

Many lives are thus sacrificed by delaying, until the evidence is only too plain, and the case gone into advanced stages. The excuse, that the knowledge of the true condition by the patient or friends is often very depressing, has nothing to do with our duty, and a judicious explanation of the state of what we find with proper advice (certainly to the friends), will oftener earn gratitude and good results, than the withholding of our honest opinion which is always supposed to be sought, and for which we take our professional fee.

Even if we should err in an occasional case, the means which we would employ under such error would also be conducive to recovery from any malady with which beginning phthisis might possibly be confounded, and there certainly could result no real harm, for here, as well as else-

where, if we must err, it is best to err on the safe side.

To really cure phthisis, even in the early stages, is not so easy a matter as consumptives, and I fear, some medical men frequently seem to imagine. Indeed if all physicians fully appreciated the difficulties and realized how little it may take to materially diminish the prospects for success, we would not meet such cases as the one whose experience in self management I have above related. We would not send patients away for so many weeks or months, as though we could foretell on what day recovery was assured. We would not fill their pockets with prescriptions, pills, mixtures and powders, and depend upon the patient's judgment to use them, but we would either go with them, or recommend them to the care and keeping of men of whose ability we have reason to think well.

When I therefore strongly urge that the consumptive should be treated in institutions located in a climate possessing immunity from the disease, properly conducted and fully equipped for phthisical patients only, it is because I have had ample opportunity to satisfy myself of the results obtainable in either case. There was a time when I did not possess the advantages of a sanitarium, subsequently I established one, unfortunately, however, without climate in its favor, but nevertheless with much better results to my patients, than I obtained in private practice; and when at much sacrifice I abandoned my labors there, and established the Winyah Sanitarium at Asheville, I did so, because I fully realized the opportunity of doing more efficient work than under my previous circumstances, and my results since fully justify my expectations.

The following tables and explanations show the value of treatment with and without climatic aid, in private practice and special institutions. The cases comprise all that came under my care in the last ten years of which I have accurate records, and have been able to ascertain the final outcome.

TABLE No. 1.

243 cases of Phthisis from private practice.

Stage of the disease and management.	Number of cases.	Recovered.	Per cent.	Much improved and still alive.	Per cent.	Died.	Per cent.
Early stage treated at home.....	94	3	3.2	2	2.2	89	94.6
Advanced stage treated at home.....	88	1	1.1	0	.....	87	98.9
Early stage sent AWAY for climatic benefits.	17	4	23.5	1	5.8	12	70.
Advanced stages sent away for climatic benefits	44	2	4.5	2	4.5	40	90.9
Totals.	243	10	4.1	5	2.	228	93.8

The treatment of those who remained at home, in an extremely unfavorably climate where consumption is very prevalent, consisted in advice to live an out-of-door life as far as possible, to exercise short of fatigue when free of fever. Directions were given as to general hygiene, and especially of the sick room, the diet was ordered to be as nutritious as possible and adapted from time to time to existing states of the digestive organs, as far as

circumstances would allow, and besides symptomatic treatment, such remedies were prescribed as at the time enjoyed greatest professional favor, including the hypophosphites cod liver oil, arsenic, creosote, astringent and antiseptic inhalations, deep injections of phenol and iodine, external counter-irritation, etc. The cases sent away for climatic benefits pursued some such treatment under the care of local physicians at the various climatic resorts. The advantages of climate are strikingly evident in the percentage of recoveries, although it must be taken into consideration that it was chiefly the poorer class who make up the numbers treated at home, in whom less favorable hygienic conditions, often want of good and suitable food, and many times the necessity for continued labor, certainly had their influence in favoring the fatal course of the disease.

TABLE No. 2.

58 cases of Phthisis treated in a special institution in the same locality and consequently without climatic advantages.

Stage of disease.	Number.	Recovered.	Per cent.	Much improved & still alive.	Per cent.	Died.	Per cent.
Early stage	32	19	59.3	9	27.5	4	12.8
Advanced stages	26	5	19.2	5	19.2	16	61.5
Totals	58	24	41.5	14	24.1	20	34.5

In connection with these cases it is fair to state that with few exceptions very far advanced or hopeless cases

were not admitted. The management was practically the same as pursued in the next class and will be described further on.

TABLE NO. 3.

29 cases of Phthisis treated in a special institution, at Asheville, N. C., and consequently under favorable climatic conditions.

Stage of disease.	Number.	Recovered.	Per cent.	Much improv'd but gone home before permanent result could be obtained.	Per cent.	Moderately improv'd & gone home.	Per cent.	No improvement & returned home by our advice.	Per cent.	Died.	Per cent.
Early stage	3	3	100	0		0		0		0	
Advanced stage	26	9	33.4	5	19.2	6	23	4	15.4	2	7.7
Totals	29	12	41.3	5	17.2	6	20.7	4	13.7	2	7

TABLE NO. 4.

22 cases of Phthisis still under treatment in the same institution.

Stage of disease.	Number.	Much improved. Prospects favorable.	Per cent.	Moderately improved.	Per cent.	No material change for better or worse.	Per cent.	Growing worse.	Per cent.
Early stage	6	5	83.3	1	17.7	0	....	0	
Advanced stage	16	6	37.5	4	25	3	18.7	3	18.7
Totals	22	11	50	5	22.7	3	13.6	3	13.6

Of the cases in Table No. 3 reported as recovered, I of course, am aware, that these results may be changed by relapses in the future, but the disease in some of the much

improved cases would have undoubtedly become permanently arrested if they had remained under treatment. I take it for granted that the moderately improved cases and those returned home, will eventually die of phthisis. Regarding the cases from Table No. 4, so much may be said that at least half of all are doing very well, and there is every prospect that as good results will eventually be obtained as in the discharged cases of Table No. 3.

Of the improved cases in the advanced stage of Table No. 4, a cure in the sense of permanent arrestment of the disease is very probable. The scarcity of early stage cases, only 9 out of 51, makes the total results of course less favorable, but on the whole it must appear evident to any observer that the results are much better than obtained without favorable climate and under the same management. The climatic influence is equally apparent in Table No. 1, and while I am fully aware of the fact that such small numbers do not justify absolute conclusions, they nevertheless are sufficient for the endorsement of the method which appears to give the best results, and are given in the hope that others may add their experience in the future.

For climatic advantages, in my choice of places, I was somewhat governed by the results obtained in cases sent away from private practice which are recorded in Table No. 1. I selected Asheville, N. C., after full personal investigation of its climate, especially with reference to the immunity from phthisis of its native residents, which by the labors of Dr. Marcy, of Boston, Dr. Gleitsmann, of New York, Dr. Chaille, of New Orleans, Drs. Lloyd and Segur, of Brooklyn, and others, was previously well established. Before the preparation

of this paper I again examined the records of deaths for the city of Asheville during the year past, and with considerable expenditure of time, investigated the nativity and history of each of the 11 deaths from phthisis, which appear in these records; I find that of these cases ten occurred in persons who came to Asheville for their health from a distance, and only one, a negro, can be considered a resident. We have therefore, no deaths from phthisis among the white population at all, and only one out of a population of over 10,000 inhabitants. The death-rate from all causes is very low, especially among the whites, the city is clean, and the recent completion of a thorough system of sewerage, the presence of good water works with filters, and the establishment of an efficient health board with a competent medical man for its executive officer, leaves little to be desired from a sanitary point of view; now the city government will need to deal with the improvements needed in streets and sidewalks, and the establishment of a public park to make Asheville one of the leading resorts for pulmonary diseases in the United States.

Older meteorological data, especially the observations made by Dr. Gleitsmann, of New York, are recorded in medical literature, and have been confirmed by the observations made during the last year by the U. S. Signal Service station under my charge, as may be seen from the following table:

SUMMARY OF METEOROLOGICAL OBSERVATION OF THE WINTER OF 1888-1889,*

MADE AT
THE U. S. SIGNAL SERVICE STATION, WINYAH SANTARIUM,
ASHEVILLE, N. C.

Elevation, 2,350 feet above Sea Level. Latitude, 35.36 N. Longitude, 82.26 W. (Hours of observation, 7 a. m., 2 p. m. and 9 p. m.)

(Self registering max. and min. thermometer with Northern exposure of all instruments, protected from direct rays and radiation from the sun. Barometer correction for altitude averages about 2½ inches. The readings given are reduced to the sea level).

MONTH.	Mean Temperature.	Mean Maximum Temp.	Mean Minimum Temp.	Absolute Maximum Temp.	Absolute Minimum Temp.	Mean Daily Range of Temperature.	Mean Relative Humidity.	Mean Absolute Humidity.	Number of Clear and Fair Days.	Number of Cloudy and Rainy Days.	Number of Days Without Sunshine.	Number of Days on which 0.01 or more of rain fell.	Total Amount of Rainfall & Melted Snow in Inches.	Snowfall in Inches.	Number of Days on which 0.10 or more of snow fell.	Mean Barometer Corrected for Altitude and Temp.	Direction of Prevailing Winds.	Mean Force of Wind on Scale of 0 to 6.
November	48 40	60 12	40 96	69 51	28 49	19 16	64 20	2 2 4	23	7	2	3 49	0	0	30 18	NW	1 88	
December	41 50	54 10	36 66	62 40	22 10	17 44	62 80	2 014	25	5	1	2 94	0	0	30 20	NW	1 40	
January	38 50	48 00	29 30	59 80	3 00	18 70	66 30	1 968	24	6	2	9	2 59	0 20	1	30 21	N&NW	0 94
February	37 00	46 73	26 03	69 52	6 50	20 73	55 60	1 894	24	4	1	4	1 68	4 54	4	30 27	N&NW	1 15
March	45 00	55 44	35 72	72 80	21 20	19 72	58 40	2 120	26	5	0	7	0 43	0	0	30 16	N&NW	1 06
April	56 38	67 74	41 12	83 00	28 50	22 06	53 44	2 754	25	5	0	7	1 45	0	0	30 08	N&NW	1 90
Total	266 78	332 13	212 76	417 00	120 10	118 37	340 74	13 062	147	32	6	27	12 53	4 74	5	181 0		8 36
Mean for winter months..	44 46	55 35	35 46	69 50	20 20	19 73	60 12	2 177	24 5	5 3	1	6 5	2 09	..	..	30 18	NW	1 33

*Recently observations of the presence of ozone in the atmosphere have been added to our meteorological records, and so far an average of 45 degrees by Schoebel's scale of 0 to 100 has been found to be present.

Places having a relative immunity from phthisis exist in the United States in considerable numbers, and the establishment of proper institutions there, for the exclusive treatment of consumptives, as affording the greatest prospects for recovery, is a matter of great importance. Those who believe in direct infection by contact with tubercular individuals, see an additional reason why tubercular patients should be treated in institutions only, as there, more likely than anywhere else, the proper preventative measures would be employed and the spread of the disease diminished. The necessity for such institutions is being more and more recognized and the objections that have been urged, are theoretical only. The supposed depressing influence from the congregation of many sick people does not exist in fact. There are always enough friends who are well, and who accompany the invalids, to take away the appearance of general sickness, and the consumptive, especially in the earlier stages, is not so markedly different in appearance, as to produce a depressing influence. On the contrary, the improvement made by others inspires hope to the new comer and he is the more manageable and desirous to comply with the measures adopted for his interest. Neither is the appearance of illness absent, when patients reside outside and in the hotels or boarding houses at climatic resorts, inasmuch as consumptives are the chief patrons of these places, and many who should keep their rooms for their own interest, persist in being up, come to the dining rooms coughing and expectorating there during their meals, a condition which in a good institution would never occur. Ventilation, disinfection and cleanliness are never so well attended to in private

boarding houses or hotels, and I am well satisfied that the healthfulness of proper institutions will compare favorably with that of any hotel or boarding house at climatic resorts or other places. The institution besides being correctly located as to climate, should be so situated as to protect the patients from severe wind, and from dust, smoke, noise and intruders. The location must allow of good natural drainage, and there must be a plentiful supply of pure water. The grounds must be sufficiently large so that all the walks for exercise, and means for recreation and pastime, can be had within their limits; graded walks, plenty of shade, good seats for rest placed at short distances, are essential, and a combination of such location with beautiful scenery very desirable, in short, the place must afford every opportunity for out-of-door life and exercise with the least possibility of leading to fatigue and injury. The building itself should be a substantial structure, with large verandas, well heated and ventilated, and must have every convenience for the care and comfort of its patrons. The food must be well prepared, the provisions the very best and adapted to the accomplishment of nutrition and sufficiently varied. Special diet, as the physician may order, must be obtainable at all times. But few, if any, of the consumptives who seek the advantages of climate find these requirements except in institutions.

In addition, the institution must be under the control of the physician in all its appointments, he alone is interested that patients should have that which is essential, whereas when the house is under the control of parties who seek to make profits from the patient's entertainment, frequently the table is deficient, or other matters undesirable are committed, or left unattended.

The professional supervision of the individual patient is equally important. What a patient may do one day with benefit may result the next day in irreparable harm. The management of fever, haemoptysis, pleurisy, etc., to be efficient requires such frequent and perhaps instant professional attendance, as only the physician under the same roof with his patient can give.

Patients when received in my Sanitarium receive as soon as possible after arrival such investigation and study of their condition, as is needful to determine the previous course, and present state of their disease. If free from fever, they receive general instruction as to out of door life and exercise, governed by their heart action and condition of general health, but all alike are cautioned, to avoid over-exertion, "others may get tired and rest, *the consumptive must rest before he gets tired.*" Exercise, or walks beyond the grounds of the institution are not allowed without previous consultation. For the better hygiene of the skin and in the absence of contra-indications the patients receive rubbings with salt water, with or without alcohol, upon rising; in the presence of fever and especially of night sweats, also at bed time. With arrival in this mountain region the desire for food frequently exceeds the powers of digestion, and patients need frequently to be cautioned to avoid over-eating, but food is offered more frequently, (5 to 6 times a day.)

The treatment of fever : If fever is present on admission, or if it occurs subsequently, the patient is put to bed until the character of the fever, with its maxima and minima is established and the afebrile period ascertained. During the latter the patient is allowed to be up, he must

certainly be kept out of doors, if only upon a reclining chair in a protected place. The next rise is anticipated by retiring an hour before the time of rise of the previous day. During the fever the food is light, chiefly liquid, preferably milk, koumyss, gruels, broths, soups, according to taste, and administered in small quantities and frequently.

If the fever does not yield to rest and diet and no counter-indication exists, then stimulants are used, whiskey or cognac, or good wine, according to taste; a liberal dose an hour before the expected rise and repeated once or twice in intervals of one or two hours seldom fails to show its influence, not, however, by reducing the temperature like we see after the use of full doses of antipyretics, but at least by a fraction of a degree from the previous maximum and by shortening of the duration. Thus, by a steady gain from day to day, we arrive eventually at an afebrile period. If matters go slow, or the fever is intense, an ice bag over the heart is of material aid, and often sufficient without alcohol, especially in the fevers occurring late in the evening. It is but seldom that I find it necessary to resort to the use of antipyretics, if I do, I prefer small doses of antifebrine in connection with the above management.

The cases where chills occur with the rise of temperature are more difficult to manage; when occurring in the forenoon, the patient is not permitted to rise; chilling by cold washing or getting out of bed for any purpose, must be avoided; hot alcoholic drinks are given an hour before the expected chill, at the same time hot water bags are applied to the extremities, and the chills under this management, as a rule, become very slight, and in a

short time the accession of fever is no longer accompanied by this unpleasant symptom.

In severe cases the ice bag is also of aid, but must never be applied until all symptoms of the chill have for the time entirely disappeared. When chills occur during the night it is necessary to have the aid of a competent nurse for their control. This management must be continued until the daily maximum temperature is considerably reduced, when it becomes the same as in other cases of fever.

With day temperatures of less than 100° F, the bed is not always deemed essential, the patients may rest quietly upon a reclining chair out of doors, until the temperature subsides; but even when patients are kept in bed, the latter is brought close to the open window to admit of the air and sunlight reaching the patient directly.

Fever, not infrequently, is kept up by disturbances of the digestive organs, and occasionally a hearty meal sends the otherwise normal temperature up to 100° or 101° F; the same is true of mental excitement, improper use of alcoholics, over-exertion and severe fatigue, violent cough, social games, especially cards and chess. These factors must be borne in mind in the management of fever, and by the close observations in an institution we soon learn to account for such irregular rises of temperature, and avoid their repetition. We had a patient a short time ago, who on every night he played whist showed a temperature above 102°, whereas his temperature was normal on evenings when he abstained from his favorite amusement, and it is quite frequent that patients who exceed the limits of exercise prescribed or have indulged themselves otherwise, betray the indiscretion by an unusual temperature.

The management of diet in phthisis, presents at times considerable difficulties, especially in the presence of gastric and intestinal catarrhs. These catarrhal states are frequently due to the immoderate use of alcoholic stimulants. Under such circumstances much discretion is necessary in their administration for fever, they may have to be avoided altogether, or a good wine, preferably the Hungarian Tokay, may take the place of whisky or brandy. In gastric catarrh which does not yield to the usual medication and regulation of diet, the frequent washing, and perhaps feeding through the stomach tube, has given me most satisfactory results; and any previous objection to the employment of the tube, on the part of the patient is quickly overcome, after he sees the quantities of mucous and the undigested fermenting and often offensive remains of food thus evacuated, and notices the betterment of his condition resulting from the washings, which also furnish an important guide in selecting the quality and regulating the quantity of food to be given. We thus exchange guess-work for actual knowledge, and I have yet to see the case in which I did not succeed in obtaining improvement, even in the course of a week; and in all my cases nutrition was favorably affected. In intestinal catarrh I have derived much benefit from Gehe's preparation of the salicylate of bismuth, and the feeding of raw beef, if necessary through the tube. Peptonized milk, beef peptones, and koumyss are as a rule also well borne, and furnish a desirable variation with the raw beef diet. I do not, however, want to be understood as recommending the feeding of patients through the tube, after the manner of Debove for the purpose of fattening, but as highly useful in the

gastric derangements indicated, and to be abandoned as soon as the digestion of food, which the patient can eat and relish, is again possible.

Hæmoptysis under our management is of rare occurrence, and results, as I have often had occasion to observe in private practice, in most cases from over-exertion of one kind or other. Slight admixture of blood with the sputum is more frequent; requiring the use of small doses of ergot internally and for the time the abstaining from active exercise. Expectoration of blood proper, should be treated by rest in bed, by sclerotic acid hypodermically, an ice bag over the heart and if we suspect the probable source of the hæmorrhage an additional ice bag over that region. The immediate presence of professional aid, with proper assurance, would make the hypodermical use of morphia, as a rule, unnecessary to quiet the alarmed patient; more frequently small injections may have to be given to allay cough, which afterward yields to minute doses of codeia. Hot drinks and solid food are to be avoided and milk and koumyss chiefly depended upon for nourishment, given in small and frequently repeated quantities. Easy evacuation of the bowels without straining must be secured, the patient kept in his bed until every evidence of blood has disappeared from the sputum, and must be cautioned against active exertion for a time after he is allowed to be up again.

In violent hæmorrhage it is best to withhold morphine, until the immediate danger from suffocation has passed. To prevent this the patient must be encouraged to cough, and the accumulating coagula in the pharynx and larynx may require frequent removal with the finger. If cyanosis begins to show itself, stimulants do good. I

have in one such case given hypodermics of ether, which proved a powerful expectorant, and I believe saved the patient's life. Brehmer recommends champagne for the same purpose. Ice bags are of course applied, ergotine or sclerotic acid injections given, and the immediate danger passed, the case managed as in the milder form. I think well of the recommendation of ligation of the extremities in severe cases. Volland reports a case in which this proved a signal success.

In some fortunately rare cases, nothing will avail, the patient dies before any step for his relief is possible. Should the subsequent course prove obstinate and our best tried means fail, we of course have no alternative than to try what has been more or less successful in the experience of ourselves or of others.

The stage of softening and profuse expectoration is certainly a great drain upon the system; the latter is to be encouraged by proper position, and inhalations, and the cause arrested by every means at command to keep up and improve nutrition. These cases frequently show the form of fever, believed to be due to septic absorption, and I have elsewhere stated my method of management for it. The expectoration from cavities and the bronchial mucous membrane diminishes as nutrition improves, and is also much influenced for the better, by a relatively dry condition of the inspired air. In two such cases I saw benefit from the inhalation of hot air, which as I have shown, is only one way of giving relatively dry air, and with full and deep inhalations. I have also seen apparent benefit from exhibition of creosote, but in other and similar cases, in large doses and well tolerated, it seemed to exert no controlling influence. Several years

ago, when laboring under less favorable climatic conditions, I administered chemically dried air for this purpose and also heated air, and am sure that benefit was derived from it. Since residing in Asheville, I have not, in view of the favorable state of absolute and relative humidity which is shown in another place, seen the necessity for resorting to such inhalations, but have frequently observed an unmistakable relation in the amount of expectoration to the present state of moisture in the air. I have endeavored to determine this more accurately by hygrometric measurements, and from a number of experiments find that there is a constant relation between the *absolute* humidity, and the amount of moisture given off from the respiratory surface, but that the relative humidity furnishes no indication whatever in this direction.

Table showing the relation between the absolute humidity of the air and the amount of moisture given off by the respiratory surface.

Number of experiment.	AIR OF INSPIRATION.					AIR OF EXPIRATION.					Excess of moisture in grains for air of expiration over the air of inspiration.
	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity.	Absolute Humidity in grains of moisture per each cubic foot of inspired air.	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity.	Absolute Humidity in grains of moisture per each cubic foot of expired air.	
1	28.3	21.4	-4	29	0.471	97.7	96.5	97	96	18.146	17.657
2	47	35	+10	22	0.873	98	97	97	96	18.146	17.273
3	20	19.5	18	93	1.160	98	96.8	97.5	99	17.882	16.722
4	40	34.5	26	57	1.676	98	97.1	97	96	18.146	6.570
5	34	33	31	90	2.034	98	97.2	97	96	18.146	16.102
6	82.8	58.7	42	23	2.955	98	97.1	97	96	18.146	15.191
7	72.5	59.4	50	45	4.077	98	97.5	98	100	18.674	14.587
8	63	61	60	89	5.746	98	97.9	98	100	18.674	12.928
9	85.4	75.5	71	63	8.241	98	98	98	100	18.674	10.433
10	80.3	77.8	77	89	9.964	98	98	98	100	18.674	8.728

I see in these results one of the beneficial effects of a relatively dry climate upon the morbid secretions from the lung, and I have no doubt that the small amount of moisture, (a fraction over 2 grains per cubic foot), observed at Asheville during last winter, (see Table on page 28), contributed materially to my favorable results obtained.

Recurring to the management of patients, when extensive softening and profuse expectoration threaten to exhaust the patient, I have frequently had resource to rectal feeding as well, and use for this purpose pan-

creatized cod liver oil with evident success in checking the progressive emaciation, and the inunction of the skin with the same preparation has appeared of benefit. Per rectum I give it warm, from 2 to 4 ounces, to which I add a few drops of laudanum, until the patient becomes accustomed to retaining it, and, as a rule, no trace of the oil is observed in the next stool. In inunctions the oil is used hot, and thoroughly rubbed in; the adding of a few drops of the oil of wintergreen takes away the disagreeable odor, the rubbing is, as a rule, enjoyed by the patient, and I have no doubt but what a considerable part of it is absorbed.

The treatment of pleurisy becomes frequently necessary in the course of phthisis, especially in private practice. Dry and circumscribed pleurisies over softening centers and over cavities must be looked upon as conservative, inasmuch as they prevent perforation, with its dire consequences. The pain may be moderated or entirely relieved by counter-irritation or hot applications and avoidance of exertion for several days. The adhesions resulting also furnish vascular anastomosis between the costal vessels and those of the lungs, thus favoring better nutrition of underlying diseased lung tissue.

Pleuritis more extensive, and especially such with effusion, which compared with the circumscribed form, are rare, and have not occurred at all in our institution, require rest in bed and hot fomentations, and in serous effusions I have found no need for aspiration, since I treat them with doses of 20 to 30 grains of chloride of soda, repeated every 2 or 3 hours—after the recommendation of Robinson (British Medical Journal, 1883).

Purulent exudations require, of course, early evacuation and thorough drainage.

The treatment of cough. As long as accumulated secretions in the air passages require removal, cough, as such, needs not only no interference, but is the natural means for their expulsion; it is then as a rule not violent, on the contrary it gives relief.

It is, however, different with the irritative cough in the dry stages of bronchitis, or during inflammatory processes or their extension within the lung tissue proper, as well as cough due to reflex, nervous irritation, and that set up by disease in the upper air passages, when there are no secretions to be expelled; such cough aggravates the cause, there is a constant reaction between cause and symptom, and the very conditions which we seek to remove, are made worse from day to day, leading to great exhaustion, by loss of rest and the severe efforts incumbent upon the frequent, violent and prolonged paroxysms, which are also productive of vascular disturbances, frequently lead to slight, and occasionally to more severe hæmorrhages, and the increased hyperaemia of the respiratory mucous membrane becomes evident by its final, but scant, secretion, expelled with difficulty as a little frothy mucous at the end of each paroxysm. Such cough certainly requires symptomatic treatment pending our efforts to remove the cause; indeed, if we succeed in moderating it materially, nature frequently copes with the latter successfully. If the cause is not to be explained by disease of the larynx or pharynx and within reach of local treatment, soothing inhalations of vaseline vapor, steam or spray from a solution of conium, etc., frequently give much relief, and in

the absence of counter-indications, small doses of Dover's powder, codeia, or morphia are of great benefit; so are occasionally the various counter-irritants over the upper part of the chest. In most cases some of these means suffice, and after a few days of such treatment the cough moderates sufficiently so as to be no longer burdensome or a source of danger. When obstinate, I make use of the continuous flax seed poultice enveloping the whole chest and covering it with rubber cloth or oiled silk. I continue such poulticing for from two to four weeks, with much relief to the cough and pain in the chest, and also as a rule with some improvement noticeable in the local condition of the diseased lung. My attention has recently been directed to the co-called "wet jacket" as a cure for lung disease, and I have just applied one for the purpose above mentioned. I find it cleaner, lighter, and more comfortable than the poultice, and theoretically feel justified in expecting the same result as I would from flax seed. Patients who are the subject of such cough should abstain from smoking altogether, and all phthisical patients should indulge in the habit as little as possible, even when cough occurs but seldom, or has subsided altogether.

Night sweats, as a rule, yield to sponging and rubbing, after retiring, with salt water, to which wood alcohol is added in proportion of 1 to 3, and to cold salt water rubbings before breakfast. In severe and obstinate cases atropine is used.

Catarrhal affections of the nose and throat, and especially nasal stenosis, receive prompt attention as soon as possible after admission, and so do the various catarrhal states of the larynx. I am well satisfied that the cure or

improvement of such conditions at the same time exerts a favorable influence upon nutrition.

Tubercular processes of the larynx do best in my hands under local applications. When strong solutions of menthol or lactic acid are used, cocaine is first applied. I never exceed 50 per cent. of lactic acid, and prefer to apply the curette to ulcerated surfaces and rub in the acid pretty thoroughly. Cicatrization is much more rapid after curettement than without, and the painfulness of the application, under the use of cocaine, is thereby not materially increased, especially if care is taken that the applications do not reach other than the surfaces for which they are intended. The application of menthol should be made with equal care, and upon ulcerated surfaces I apply it with a camel's hair pencil and gently rub it in. Such applications, even if a little more painful, require to be made less frequently, and the results are more satisfactory. Of course to succeed well, requires a patient that is very manageable, and he has frequently to be educated and trained to allow of the necessary manipulation.

To secure a better circulation in the lungs directly, to provide for their better ventilation, and as a calisthenic for the respiratory muscles, I make use of *pneumatic differentiation*. In the early manifestations of the disease, the results that I have derived from this method have been satisfactory in the highest degree. The expansion of the apices becomes much better, the vital capacity increases and a better percussion note, a higher position of the affected apex above the clavicle together with increase of the inspiratory and expiratory force, are most constant results. A similar but frequently less

marked influence is obtainable, when the more advanced disease has become arrested and retraction of the cicatrizing lung has occurred. I do not use, nor do I recommend, this method during the presence of active inflammatory process, but only under the conditions just mentioned and believe these to be the limit of applicability for this method.

Tubercular diarrhoea and the ulcerative processes accompanying it are not often amenable to treatment, rest in bed, careful diet, and irrigation when the lower bowel or rectum are chiefly involved, together with judicious use of opiates and mild astringents have given me the best, but most frequently only temporary results. The irrigating fluid may, with advantage, contain Fluid Extract of Golden Seal, or some mild astringent. If accessible to bougies of iodoform, as are the ulcerations in the rectum, I prefer them to all other local treatment.

In all management routine methods are of course as reprehensible in phthisis as elsewhere, and our measures can be the more adapted to the individual conditions, the more we have the patient under observation and control.

In conclusion the writer feels justified to say :

1st. That phthisis is most successfully treated upon the principle of nutrition in its widest sense, thereby establishing efficient resistance to the progress of the disease, and favoring repair of existing lesions.

2d. That such treatment in an institution well conducted and equipped and located in a climate possessing immunity from the disease offers the best chances for the individual patient and leads to recovery in the greatest number of cases.

3d. That the establishment of such institutions is desirable at all proper climatic resorts, and in addition, at places even without immunity, for patients who for good reasons cannot take advantage of climate as well.

4th. That in view of our results it appears, that scientific medicine has also in phthisis complied with the demands which can reasonably be made upon it "*to cure disease in its early stages,*" and that the responsibility for obtaining satisfactory results rests upon patients and friends, and in cases of the poor classes, upon the local or general government, if the professional adviser has made an early diagnosis, and has pointed out the best means for cure.

